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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,493	11/14/2003	Gary Edward Trewiler	134314 (12729-339)	9211
23465 7590 05/27/2009 JOHN S. BEULICK C/O ARMSTRONG TEASDALE, LLP ONE METROPOLITAN SQUARE SUITE 2600 ST LOUIS, MO 63102-2740				
EXAMINER				
AFZAL, SARANG				
ART UNIT		PAPER NUMBER		
3726				
NOTIFICATION DATE		DELIVERY MODE		
05/27/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USpatents@armstrongteasdale.com

Office Action Summary

Application No.

10/713,493

Applicant(s)

TREWILER ET AL.

Examiner

SARANG AFZALI

Art Unit

3726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed 2/11/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 5, 6, 8-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) 8-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 5, 6 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsman's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicants response filed on 2/11/2009 has been fully considered and made of record.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 3, 5, 6 and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The new limitation of "providing a replacement blade portion that is produced using a **substantially similar method** as was used to produce the removed portion wherein the method includes at least one of forging and casting" as recited in claim 1, lines 9-11 is considered new matter. Note that specification, paragraph [0022], discloses that the replacement (undamaged) portion (120) **may be fabricated from a material similar** to damaged portion (90), thereby more closely matching the original material, i.e. forged vs. cast. However, there is no support in specification that the replacement blade portion is produced by using a **method substantially similar** as the method used to produce the removed (damaged) portion.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as obvious over Meier et al. (US 6,438,838) in view of Wachtell et al. (US 3,650,635) or in alternative as obvious over Meier et al. in view of Wang et al. (US 6,912,446) and Wachtell et al.

6. As applied to claims 1 and 6, Meier et al. teach a method of replacing a portion of a gas turbine engine rotor blade, the hollow (claim 18) rotor blade having an original blade contour defined by a blade first sidewall and a blade second sidewall, said method comprising:

cutting through the rotor blade such that a cut line extends from a leading edge of the blade to a trailing edge of the blade and between the first sidewall and the second sidewall, and such that the cut line extends at least partially through a hollow portion of the blade defined between the first and second sidewalls;

removing the portion of the rotor blade that is radially outward of the cut line; and
coupling with resistance welding (col. 1, lines 31-35) a replacement blade portion to remaining blade portion at a joint defined by the cut line with a weld joint extending along the cut line such that a newly formed rotor blade is formed with an aerodynamic

contour that is one of an improvement in an aerodynamic performance over the original blade contour and mirroring the original blade contour (Abstract, Figs. 1-4).

Meir et al. teach that it is well known in the art to use resistance welding to join vanes to the rotor carrier of a turbine engine (col. 1, lines 31-35) and that the coupling is done at a joint defined by the cut line (24, Fig. 4) and that it constitutes a high yield automated process of joining.

Meier et al. teach the invention cited including using an automated process (Fig. 4, col. 3, lines 53-60) and resistance welding the replacement vane section and that the replacement portion of the blade is made of titanium (claim 16) and nickel alloy (claim 17) but do not explicitly teach using a welding material including at least one of a nickel alloy and a titanium alloy and the step of single weld forming a single weld joint and that the a substantially similar method including at least one of forging and casting was used to produce both the damaged and replacement portions.

Wachtell et al. teach a method of repairing a damaged hollow turbine blade by removing a damaged area and inserting a replacement section (of the same material as the original component, i.e. nickel alloy, titanium alloy, col. 3, lines 4-9 and made by similar "casting" method as original damaged portion, col. 1, lines 49-58 & col. 2, lines 42-49) and welding the parts together with electron beam welding (well known in the art to provide a single pass weld) to provide a single weld joint along the cut line such that the newly formed rotor blade has even better and more improved characteristics than the original blade (Figs. 1, 3 & 4, col. 1, lines 53-58, col. 3, lines 50-53).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided Meier et al. with a single pass weld as taught by Wachtell et al. in order to provide a weld joint resulting in a better and more improved characteristics of the repaired blade than the original blade.

Note that Wachtell et al. teach the material for the base and replacement sections is the same including at least one of a nickel alloy and a titanium alloy. As such, the weld lines 27-29 (Fig. 4) made by the electron beam welding includes the welding material (from either base and/or replacement sections) made of nickel alloy and /or titanium alloy.

7. In alternative if the Applicants do not agree that Wachtell et al. teach the weld material including at least one of a nickel alloy and a titanium alloy, then Wang et al. in a method for repairing a damaged airfoil teach that it is well known to use a repair/replacement material and weld material to be the same as the base material in order to facilitate the welding of the replacement material to the surface of the damaged blade material (col. 5, lines 20-28).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have provided Meier et al. with a weld material made of the same material as the base blade (i.e. nickel alloy, titanium alloy) as taught by Wang et al. in order to provide an effective weld joint between the replacement portion and base blade.

It would have been further obvious to one of ordinary skill in the art at the time of invention to have provided Meier et al. with a single pass weld and a replacement portion made by similar method as the damaged portion, as taught by Wachtell et al. in order to provide a weld joint resulting in a better and more improved characteristics of the repaired blade than the original blade.

8. As applied to claim 3, Meier et al. teach that a further machining step is performed subsequent to the welding step to a desired finished dimension (col. 4, lines 13-17). Note that Meier et al. disclosure of "it may require removal in a subsequent machining step" teaches that the thickening dimension at that point is not desired and therefore the machining step will result in a desired finished dimension.

9. As applied to claim 5, Meier et al./Wachtell et al. teach the invention cited wherein Wachtell et al. teach that material of replacement and remaining blade portions are the same (col. 1, line 56) and that the compositions of superalloys used for turbine component/blade comprise of nickel-base alloy including titanium (col. 3, lines 4-9) and cobalt-base alloy including iron (Fe, col. 3, lines 10-14).

10. Claim 22 is rejected under 35 U.S.C. 103(a) as obvious over Meier et al. in view of Wang et al. and Wachtell et al., as applied to claim 1, and further in view of Dulaney et al. (US 6,238,187).

Meier et al./Wang et al./Wachtell et al. teach the invention cited including a blending of the weld-repair region by NC tool (Wang et al., claim 15, lines 21-22) but do not explicitly teach the steps of rough and final blending the welded replacement blade portion.

However, Dulaney et al. teach a method of repairing an airfoil having a damaged area wherein a section of the airfoil containing the damaged area is removed and a replacement piece is welded followed by rough and final blending of the replaced portion is used to achieve a finished dimension as necessary to put the joined airfoil within predetermined tolerances (col. 14, lines 20-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided Meier et al./Wang et al./Wachtell et al. with a rough and final blending as taught by Dulaney et al. in order to provide a finished blade that would meet the original dimensional requirements.

Response to Arguments

11. Applicant's arguments filed 2/11/2009 have been fully considered but they are not persuasive.

Applicant's amendment to claim 1 is acknowledged and as such, the rejection of claims 1, 3, 5, 6 and 22 under 35 U.S.C. 112, second paragraph is withdrawn.

Applicant mainly argues (Remarks, pages 1-4) with respect to rejection of claims 1, 3, 5, 6 and 22 that none of the applied art (Meier, Watchtell, Wang, Dulaney) describes nor suggests providing a replacement blade portion that is produced using a

substantially similar method as was used to produce removed portion wherein the method includes at least one of forging and casting.

The Examiner respectfully disagrees with the above arguments. Note that, although the examiner considers this newly added limitation to constitute "New Matter," never-the-less, Wachtell et al. teach that a damaged portion of a vane made by casting method (col. 1, lines 49-58) is replaced by a replacement portion made by a similar (casting) method (col. 2, lines 42-49) and as such, the combination of applied art, still render obvious the Applicant's invention.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARANG AFZALI whose telephone number is (571)272-8412. The examiner can normally be reached on 7:00-3:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sarang Afzali/
Examiner, Art Unit 3726
5/13/2009

/DAVID P. BRYANT/
Supervisory Patent Examiner, Art Unit 3726